



Australian Government

**Assessment Requirements for AURRTE011
Overhaul two and four-stroke cycle marine
outboard engines**

Release: 1

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Modification History

Release	Comment
Release 1	New unit of competency.

Performance Evidence

Before competency can be determined, individuals must demonstrate they can perform the following according to the standards defined in this unit's elements, performance criteria, range of conditions and foundation skills:

- overhaul three different marine outboard engines, including:
 - one two-stroke outboard engine
 - one four-stroke outboard engine.

Knowledge Evidence

Individuals must be able to demonstrate knowledge of:

- work health and safety (WHS) and occupational health and safety (OHS) requirements relating to overhauling outboard engines and associated engine components, including procedures for:
 - operating specialised engine overhaul tools, equipment and machinery, including:
 - heating torches, ovens and presses
 - handling freezing substances, including liquid nitrogen
 - using chemicals and toxic substances
 - operating manual and mechanical lifting equipment
- environmental requirements, including procedures for trapping, storing and disposing of fluids released from engines
- types, characteristics and operating principles of outboard engines and associated engine components
- outboard engine overhaul procedures, including:
 - methods for cleaning and preparing engine for overhaul
 - engine dismantling procedures

- engine and engine component inspection, measuring and evaluation procedures, including:
 - non-destructive testing (NDT) procedures, including dye penetrant testing and magnetic particle testing
 - methods for measuring and calculating tolerances and clearances
- engine and engine component repair and adjustment procedures, including:
 - engine cylinder head and block machining
 - engine crankshaft and camshaft grinding
 - engine cylinder and engine sleeve fitting, boring and honing
 - engine bearing tunnel and connecting rod repair
 - engine component heat treating, straightening and reclamation
 - engine component balancing
- engine assembly and adjustment procedures for achieving component tolerances, including:
 - piston to connecting rod big-end alignment
 - big-end bearing to crankshaft journal clearance
 - big-end bearing crush with bearing blue
 - piston ring end gap, back clearance and side clearance
 - main bearing to crankshaft journal clearance
 - main bearing crush with bearing blue
 - semi-flanged thrust bearings to crankshaft clearance
 - finished camshaft bearings to camshaft clearance
 - camshafts and cam followers
 - camshaft end float
 - crankshaft end float
 - gear backlash
 - oil pump sealing and pick-up oil piping
- component assembly procedures and processes, including:
 - welsh plugs and oil gallery plugs
 - piston and connecting rod assemblies
 - big-end bearings
 - piston rings to pistons
 - main bearings and thrust washers
 - semi-flanged thrust bearings
 - crankshafts, including protection measures for crankshaft journals, bearings, rings and bores
 - finished camshaft bearings
 - camshafts and cam followers
 - timing gears
 - chains and tensioners

- oil pumps, oil squirters, and oil pump pick-ups
- balance shafts
- fitting ancillary components, including seals, crankshaft pulleys and flywheels
- post-overhaul testing procedures for outboard engines.

Assessment Conditions

Assessors must satisfy NVR/AQTF assessor requirements.

Competency is to be assessed in the workplace or a simulated environment that accurately reflects performance in a real workplace setting.

Assessment must include direct observation of tasks.

Where assessment of competency includes third-party evidence, individuals must provide evidence that links them to the marine outboard engines that they have worked on, e.g. repair orders.

Assessors must verify performance evidence through questioning on skills and knowledge to ensure correct interpretation and application.

The following resources must be made available:

- marine repair workplace or simulated workplace
- workplace instructions
- manufacturer outboard engine specifications
- three different marine outboard engines requiring overhaul, including one two-stroke engine and one four-stroke engine
- tools, equipment and materials appropriate for overhauling and adjusting marine outboard engines.

Links

Companion Volume implementation guides are found in VETNet -

<https://vetnet.gov.au/Pages/TrainingDocs.aspx?q=b4278d82-d487-4070-a8c4-78045ec695b1>

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